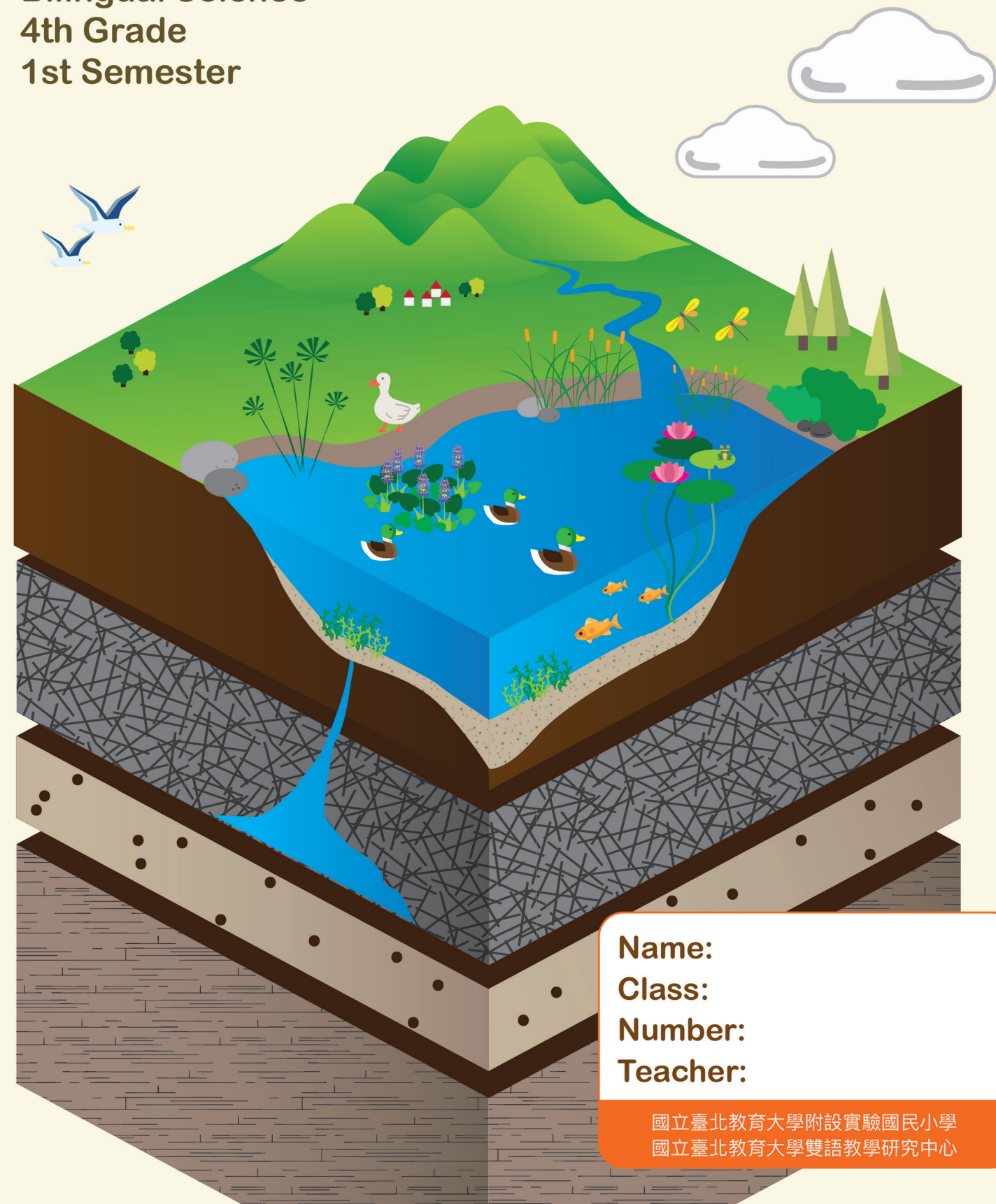


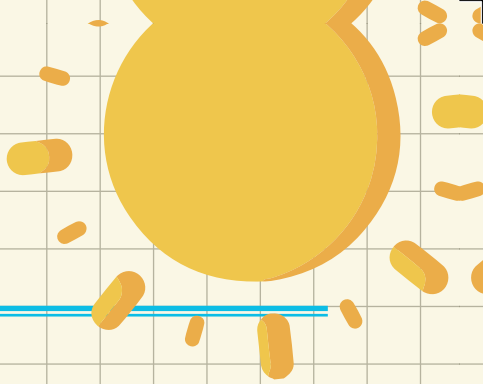
Science Notes

Bilingual Science
4th Grade
1st Semester



Name:
Class:
Number:
Teacher:

國立臺北教育大學附設實驗國民小學
國立臺北教育大學雙語教學研究中心



Preface 前言

在「2030 雙語國家政策發展藍圖」中強調「厚植國人英語力」、「提升國家競爭力」(國家發展委員會，2020)；而如何提升國民英語力以增加國際競爭力，是學校教育中努力的目標。

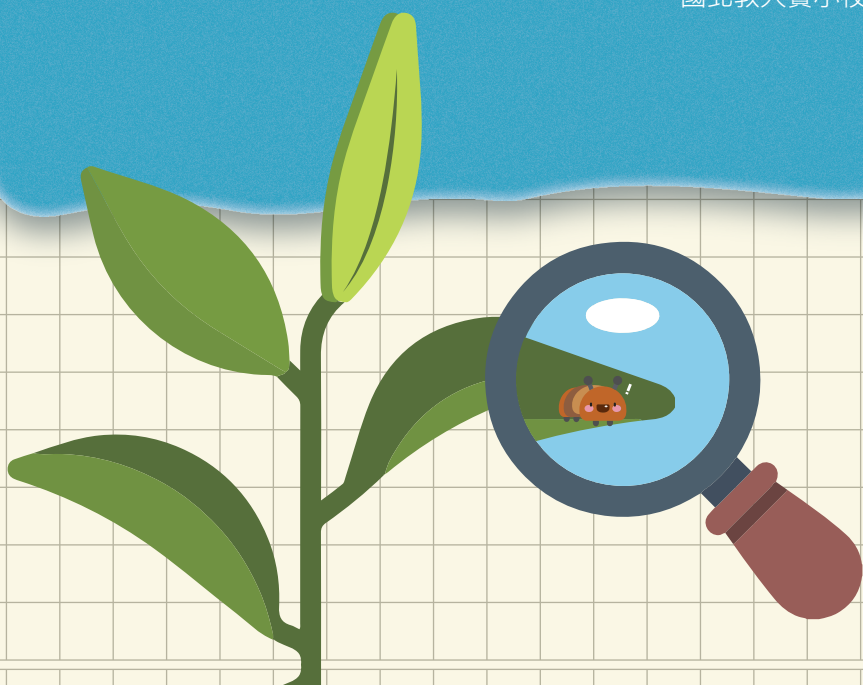
有感於雙語教育及近年來我國積極培養學童STEAM(Science, Technology, Engineering, Arts, and Mathematics)結合科學、技術、工程、藝術，以及數學跨學科素養的教育趨勢，本校自108學年度開始試辦自然課程雙語教學，以英語營造生活情境中的科學，透過趣味科學實驗增進學童以英語來進行科學探究的興趣與能力。

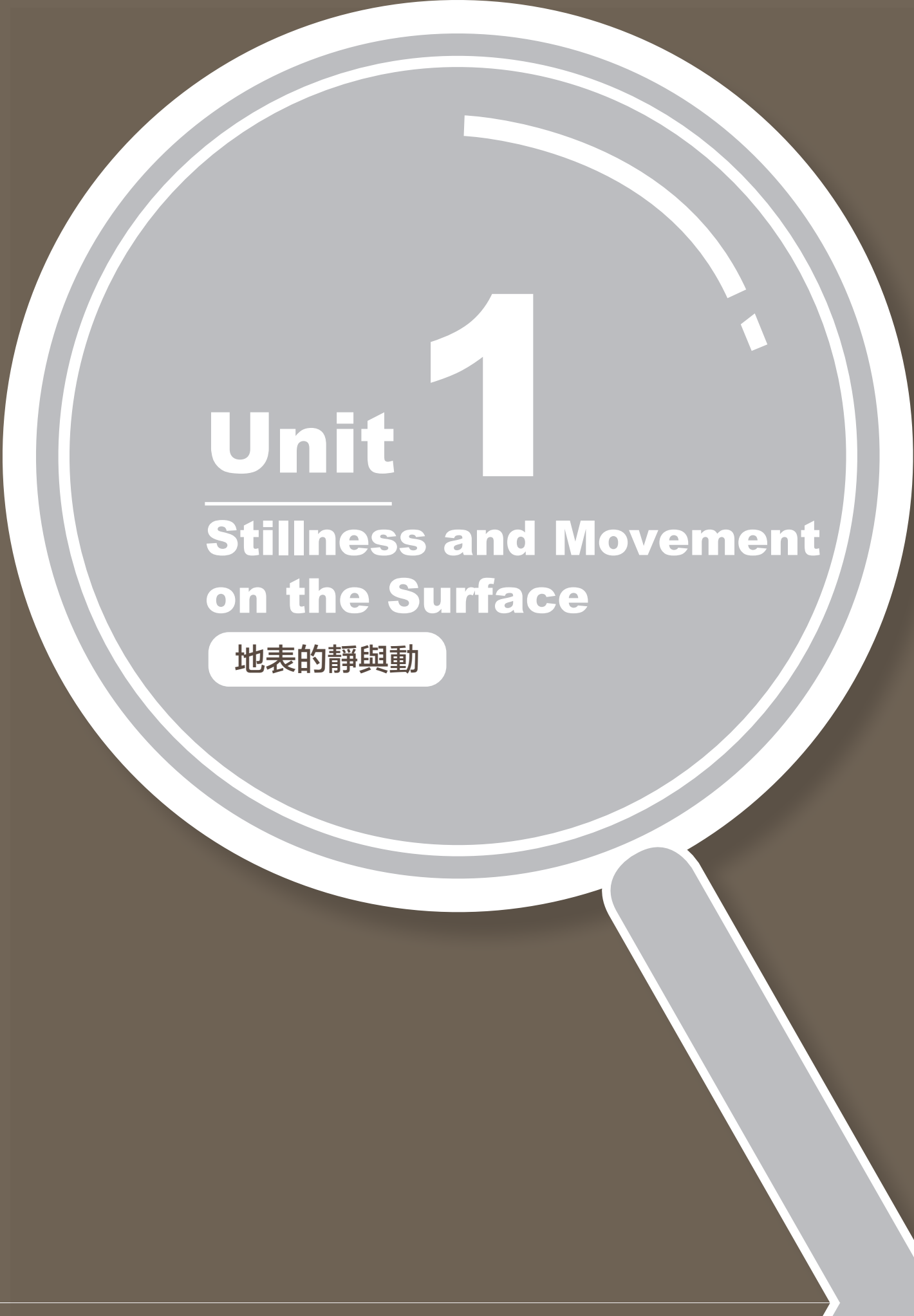
這本科學筆記本是本校自然課程雙語教學團隊~陳美卿、林雨慶、劉容昇、范瑋庭以及2022年7月剛到任的外師Leonawen 等教師所共同設計的；國立臺北教育大學雙語教學研究中心協助自然科學英語內容校對、編排及印製；期望學童可以紮紮實實的學習自然科學知識，更透過以英語指導科學實驗步驟，動手做實驗來激發學童的科學探究潛能、啟發學童善用英語進行科學領域學習的能力，厚植學童的科學力及英語力。

國北教大實小校長

魏勤捷

2022.08

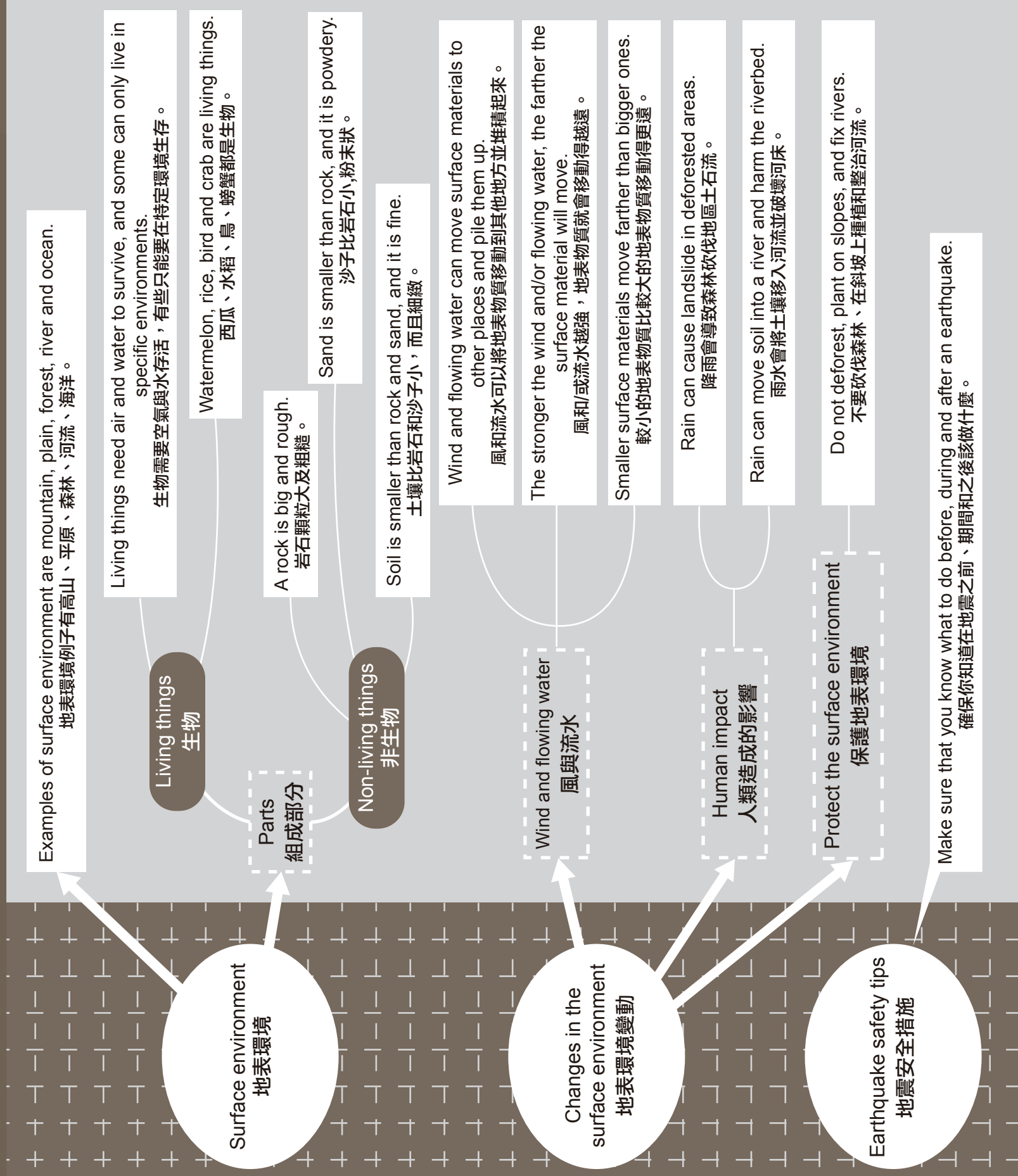
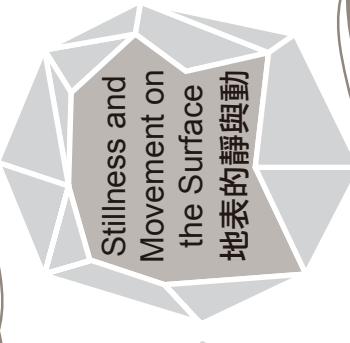




Unit 1

Stillness and Movement on the Surface

地表的靜與動



Unit 1 Stillness and Movement on the Surface

地表的靜與動

日期： /

應聽懂及認讀的生字

☐ 1. 靜止	stillness	☐ 14. 風	wind
☐ 2. 移動	movement	☐ 15. 活水/流水	flowing water
☐ 3. 地表/表面	surface	☐ 16. 地表物質	surface material
☐ 4. 環境	environment	☐ 17. 土石流	landslide
☐ 5. 生物	living thing	☐ 18. 森林砍伐(n)	deforestation
☐ 6. 空氣	air	☐ 19. 森林砍伐(v)	deforest
☐ 7. 水	water		
☐ 8. 生存(n)	survival	☐ 20. 地震	earthquake
☐ 9. 生存(v)	survive	☐ 21. 安全	safety
☐ 10. 非生物	non-living thing	☐ 22. 急救箱	survival kit
☐ 11. 礫石	rock	☐ 23. 演練	drill
☐ 12. 沙子	sand	☐ 24. 逃生路線	escape route
☐ 13. 土壤	soil	☐ 25. 電梯	elevator
		☐ 26. 電器設備	electrical equipment

1. Different surface environments have different characteristics.

不同的地表環境有不同的特點。

2. Wind and flowing water can change the surface environment.

風與活水會改變表面環境。

3. To protect the environment, do not deforest, plant on slopes, and fix rivers.

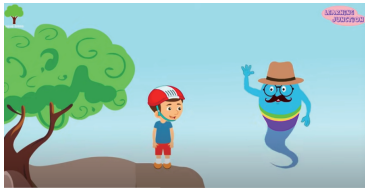
為了保護環境，不要砍伐森林，不要在斜坡上種植，不要整治河流。

4. Make sure that you know what to do before, during and after an earthquake.

確保你知道在地震之前、期間和之後該做什麼。

Science Videos Unit 1

1-1 Types of Landforms



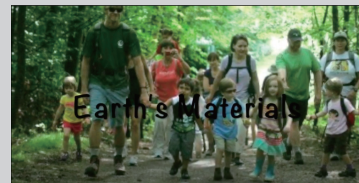
1-1 Animal Habitats | Animal Homes



1-1 Rocks, Pebbles and Sand



1-1 Earth Materials



1-2 Sand Dune Formation and the Rock Cycle



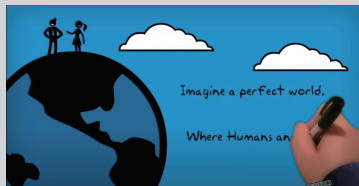
1-2 Weathering and Erosion for Kids



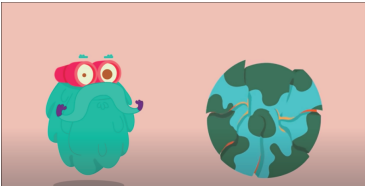
1-2 Weathering, Erosion and Deposition Experiment



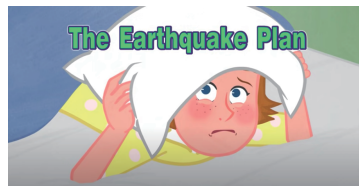
1-2 Habitat Destruction



1-3 What is an Earthquake?



1-3 The Earthquake Plan



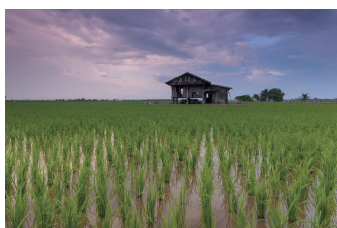
Landforms and bodies of water

Look at the pictures below.

Draw ▲ inside the ☐ if it is a landform.

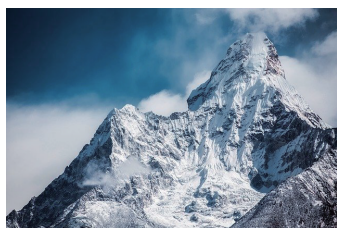
Draw ● inside the ☐ if it is a body of water.

Draw a line to match each picture to its name.

☐

•

• **mountain** (高山)

☐

•

• **paddy field** (水田)

☐

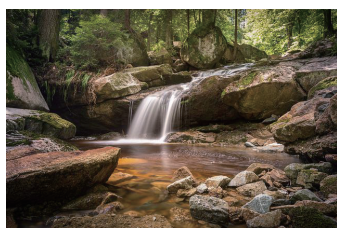
•

• **pond** (池塘)

☐

•

• **river** (河流)

☐

•

• **sea** (海)

Surface materials

Which surface material is shown in each picture?
Write **rock**, **sand** or **soil** inside the .



... Changes in the surface environment ...

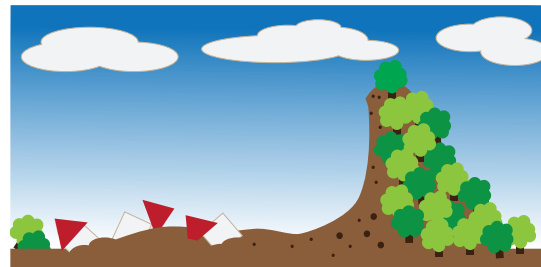
Draw a line to match each **cause** (原因) to its **effect** (結果).

Cause (原因)

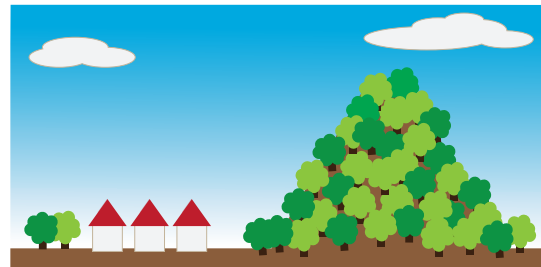


heavy rain in a deforested area

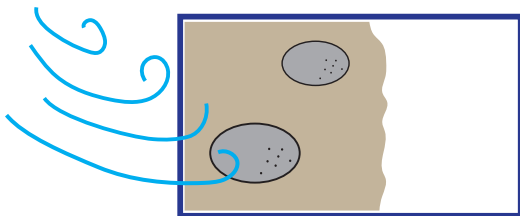
Effect (結果)



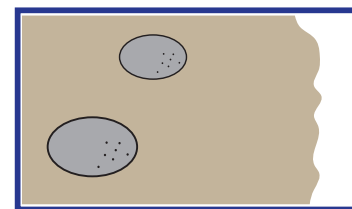
landslide



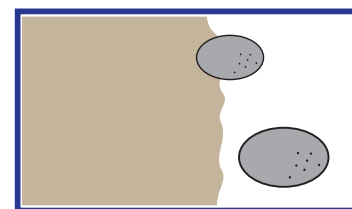
more trees grow



wind blows through soil and rocks



soil travels farther



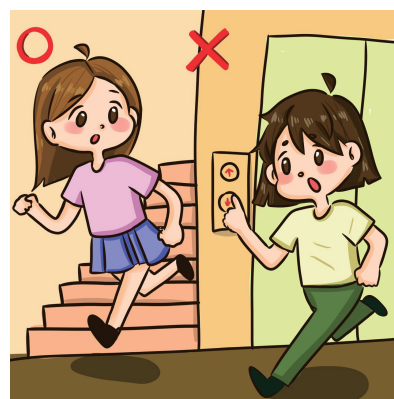
rock travels farther

Earthquake safety tips

When should you do these earthquake safety tips?
Write **before**, **during** or **after** inside the .







Circle the things that you should put inside your earthquake survival kit.



first aid kit



food
(by Getty Images)



whistle

Let's review

Fill in the blanks using the words below.

deforest
soil

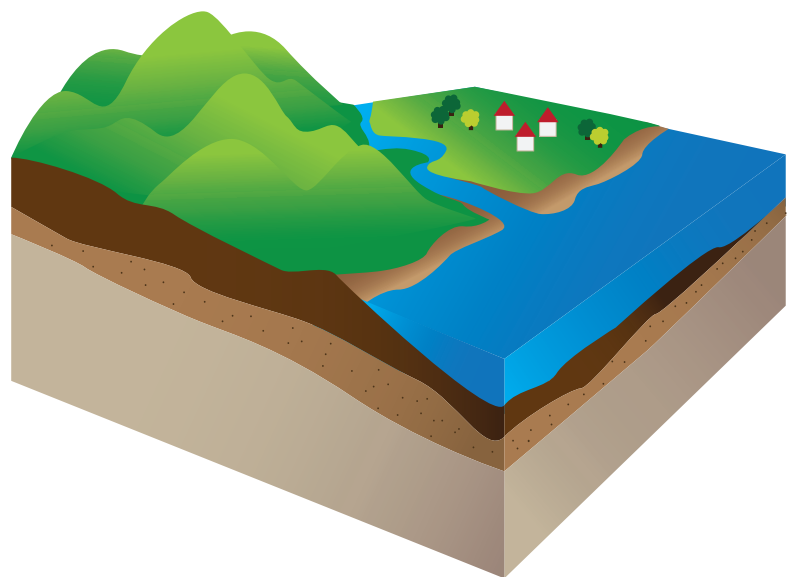
earthquake
water

non-living things
wind

The surface environment is made up of living things and _____.
Living things need air and _____ to survive. Non-living things include rock, sand and _____.

The surface environment can change because of _____, flowing water and human activities. To protect the surface environment, do not _____, plant on slopes, and fix rivers.

The surface environment can also change because of earthquakes. Make sure that you know what to do before, during and after an _____.

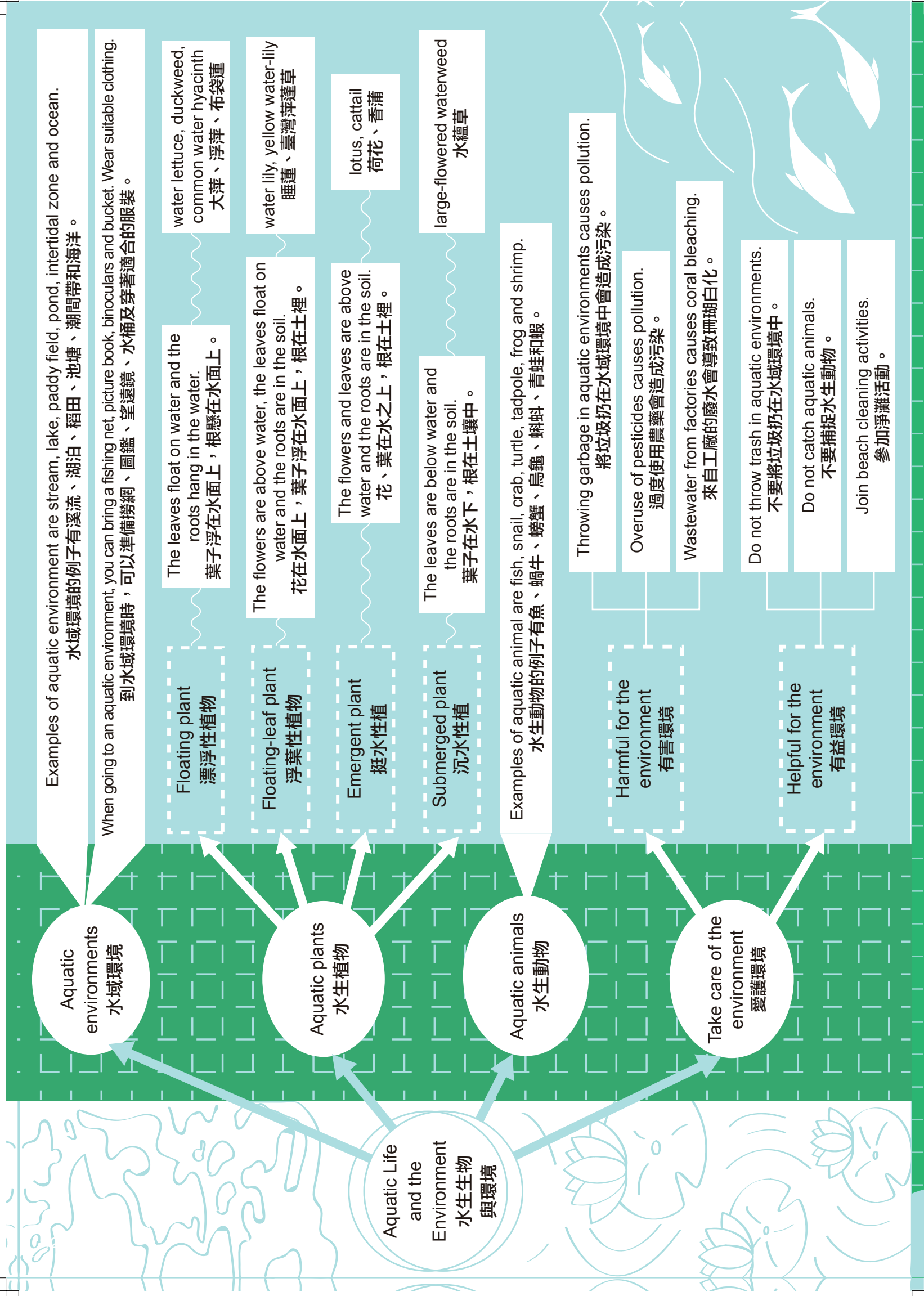




Unit 2

Aquatic Life and the Environment

水生生物與環境



Unit 2 Aquatic Life and the Environment

水生生物與環境

日期： /

應聽懂及認讀的生字

- | | |
|----------------------------------|---------------------|
| ☐ 1. 水生的 | aquatic |
| ☐ 2. 水域環境 | aquatic environment |
| ☐ 3. 溪流 | stream |
| ☐ 4. 湖泊 | lake |
| ☐ 5. 水田 | paddy field |
| ☐ 6. 池塘 | pond |
| ☐ 7. 潮間帶 | intertidal zone |
| ☐ 8. 海洋 | ocean |

- | | |
|------------------------------------|---------------------|
| ☐ 9. 水生植物 | aquatic plant |
| ☐ 10. 漂浮性植物 | floating plant |
| ☐ 11. 浮葉性植物 | floating-leaf plant |
| ☐ 12. 挺水性植物 | emergent plant |
| ☐ 13. 沉水性植物 | submerged plant |
| ☐ 14. 葉柄 | petiole |
| ☐ 15. 空心的 | hollow |
| ☐ 16. 葉子 | leaf/leaves |
| ☐ 17. 花 | flower |
| ☐ 18. 莖 | stem |
| ☐ 19. 根 | root |

- | | |
|-----------------------------------|-----------------|
| ☐ 20. 軀幹 | body |
| ☐ 21. 肺 | lungs |
| ☐ 22. 鰓蓋 | gill cover |
| ☐ 23. 鰭 | fin |
| <hr/> | |
| ☐ 24. 汙染 | pollution |
| ☐ 25. 殺蟲劑 | pesticide |
| ☐ 26. 廢/汙水 | wastewater |
| ☐ 27. 珊瑚礁 | coral reef |
| ☐ 28. 珊瑚白化 | coral bleaching |

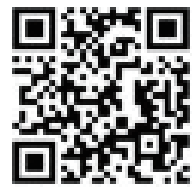


1. Aquatic plants have special structures to help them live in water.
水生植物有特殊構造幫助它們在水中生活。
2. Aquatic animals have special movement and breathing structures to help them live in water.
水生動物有特殊的運動和呼吸結構來幫助它們生活在水中。
3. We must take care of the aquatic environment.
我們必須愛護水環境。

本頁完成日期： /

Science Videos Unit 2

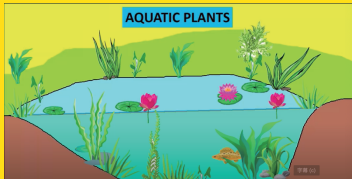
2-1 13 Animals Live on Trees



2-1 Explore Aquatic Habitats



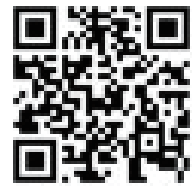
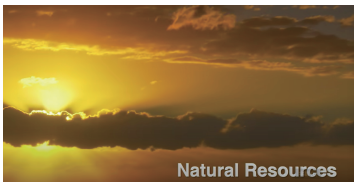
2-2 CBSE: Class 4:
Science: Aquatic Plants



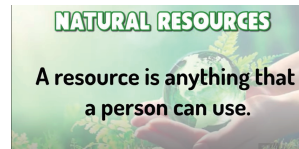
2-2 Animals that Live
Both in Land and Water



2-3 Natural Resources
for Kids



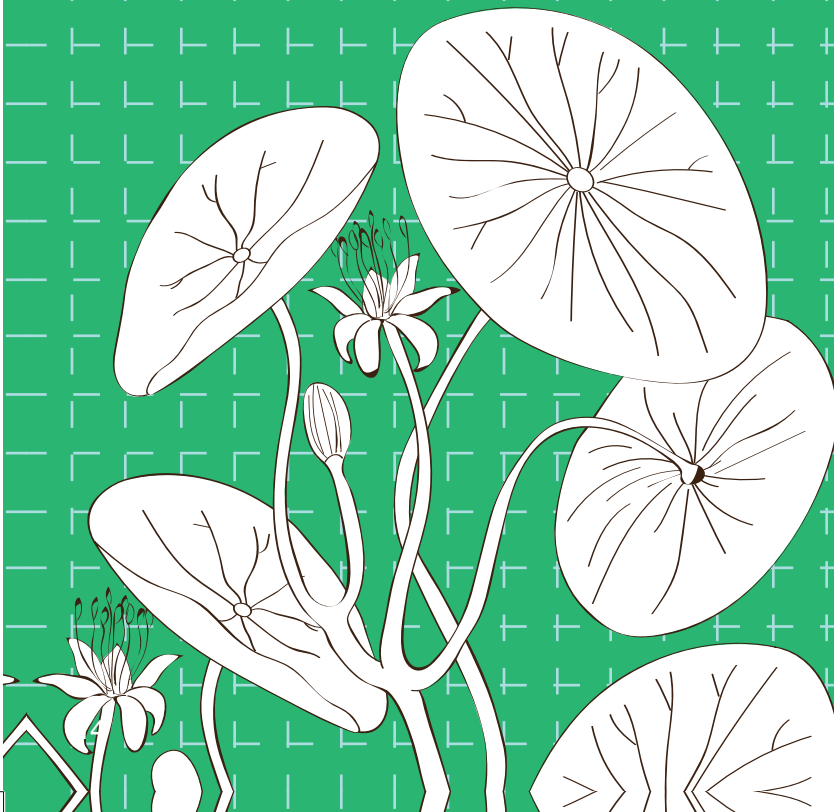
2-3 Natural Resources
eLearning Video Lesson
for Kids



2-3 Save Our Ocean
from Plastic Pollution



2-3 How Kids Can
Protect Water Sources



Aquatic environments

Color all aquatic environments.



forest
(森林)



grassland
(草地)



intertidal zone
(潮間帶)



lake
(湖泊)



mountain
(高山)



paddy field
(水田)



pond
(池塘)



river
(河流)



sea
(海)

Aquatic plants

Match each aquatic plant to its type.



large-flowered waterweed
(水蘊草) 薪資調查

emergent plant
(挺水性植物)



lotus
(荷花)

floating plant
(漂浮性植物)



water lettuce
(大萍)

floating-leaf plant
(浮葉性植物)

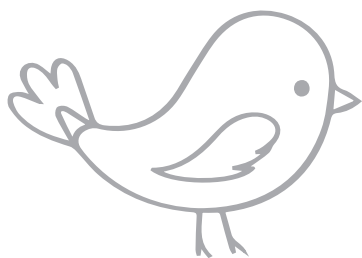


water lily
(睡蓮)

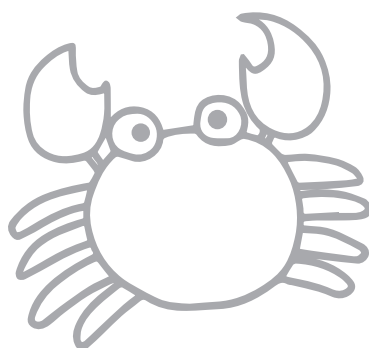
submerged plant
(沉水性植物)

Aquatic animals

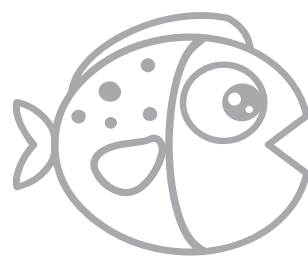
Color all aquatic animals.



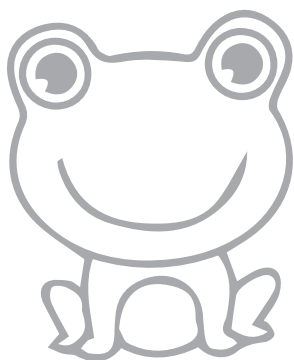
bird (鳥)



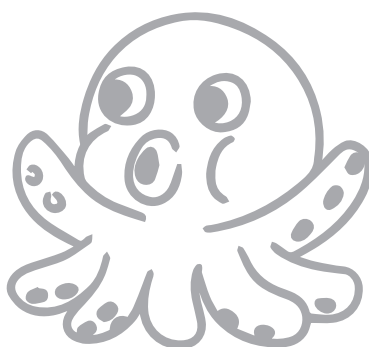
crab (螃蟹)



fish (魚)



frog (青蛙)



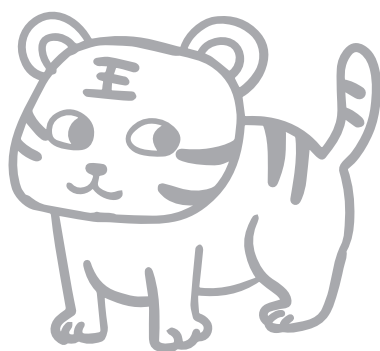
octopus (章魚)



snail (螺)



snake (蛇)



tiger (老虎)



turtle (烏龜)

Care for the environment

Circle the activities that you can do to take care of the aquatic environment.



join beach cleaning
activities
(by Getty Images)



throw garbage in
rivers



return animals to
the sea
(by Sijori Images)

Draw a poster to show how you can save the aquatic environment from pollution.

A large, empty rectangular area with a dashed green border, intended for drawing a poster.

Let's review

Fill in the blanks using the words below.

animals
pollution

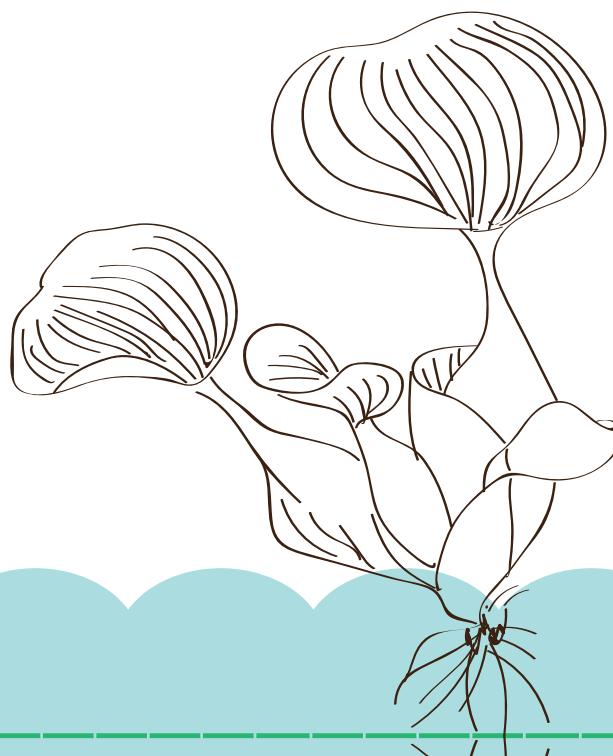
aquatic
shrimp

cleaning
submerged

Taiwan has a rich _____ environment. Aquatic plants and aquatic _____ live in this environment.

There are four types of aquatic plants: floating plant, floating-leaf plant, emergent plant, and _____ plant. There are many kinds of aquatic animals such as fish, snail, crab, turtle, tadpole, frog and _____.

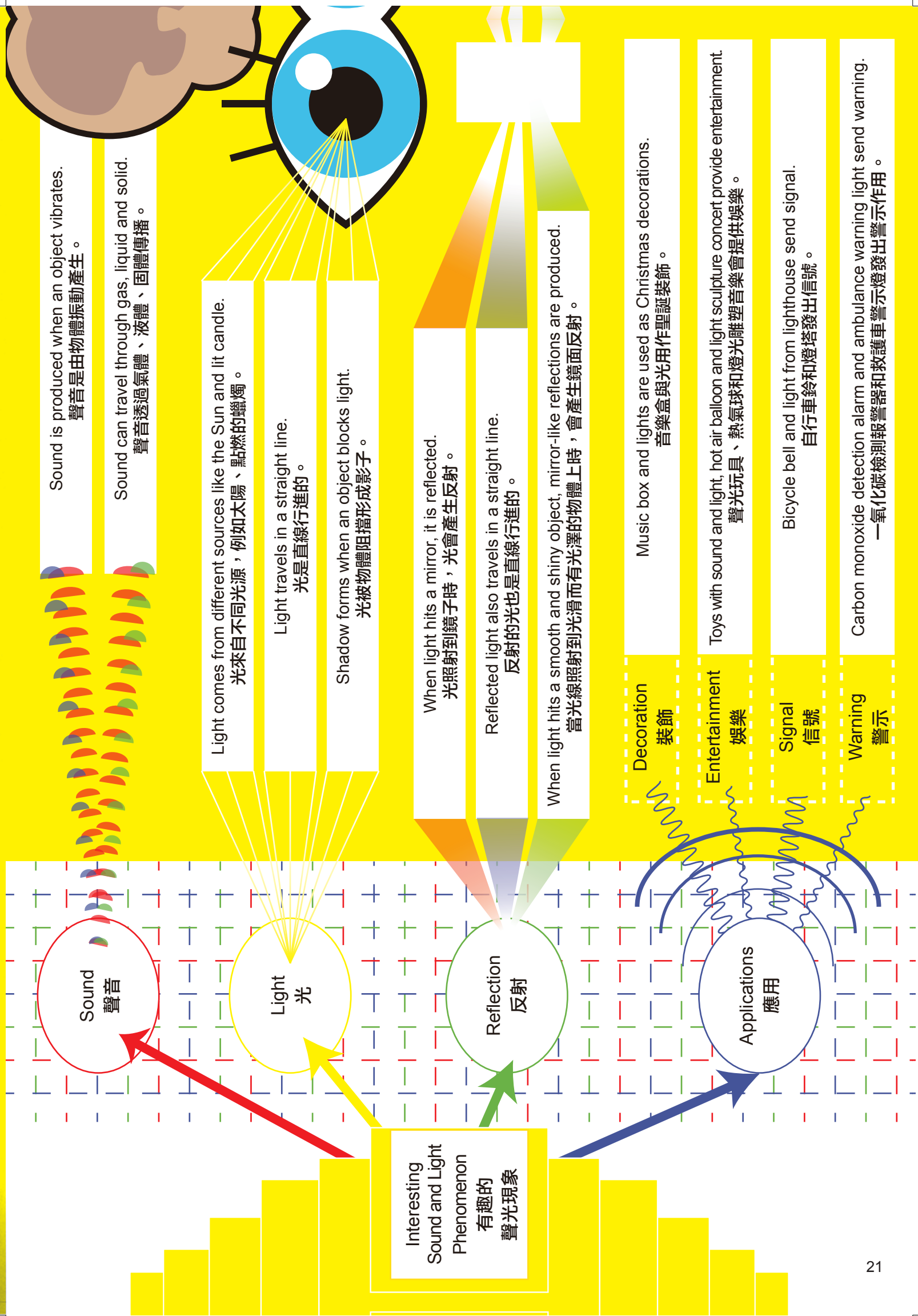
_____ is harmful for the aquatic environment. To care for the aquatic environment, do not throw trash, do not catch aquatic animals, and join beach _____ activities.



Unit 3

Interesting Sound and Light Phenomenon

有趣的聲光現象



Unit 3 Interesting Sound and Light Phenomenon

有趣的聲光現象

日期： / /

應聽懂及認讀的生字

☐ 1. 現象 phenomenon

☐ 2. 聲音 sound

☐ 3. 產生(n) production

☐ 4. 產生(v) produce

☐ 5. 物體 object

☐ 6. 振動(n) vibration

☐ 7. 振動(v) vibrate

☐ 8. 行進/旅行 travel

☐ 9. 氣體 gas

☐ 10. 液體 liquid

☐ 11. 固體 solid

☐ 12. 光 light

☐ 13. 光源 light source

☐ 14. 陽光 sunlight

☐ 15. 蠟燭 candle

☐ 16. 雷射光 laser

☐ 17. 影子 shadow

☐ 18. 反射(n) reflection

☐ 19. 反射(v) reflect

☐ 20. 鏡子 mirror

☐ 21. 光滑的 smooth

☐ 22. 閃亮的 shiny

☐ 23. 裝飾 decoration

☐ 24. 娛樂 entertainment

☐ 25. 信號 signal

☐ 26. 警示 warning

1. Sound is produced when an object vibrates.

聲音是由物體振動產生。

2. Light travels in a straight line.

光是直線行進的。

3. When light hits a mirror, it is reflected.

光照射到鏡子時，光會產生反射。

4. Sound and light can be used for decoration, entertainment, signal or warning.

聲光可用於裝飾、娛樂、信號或警告。

Science Videos Unit 3

3-1 What is Sound? |
The Dr. Binocs Show



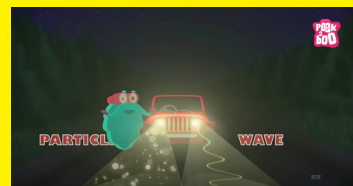
3-1 What is Sound? |
Physics for Kids



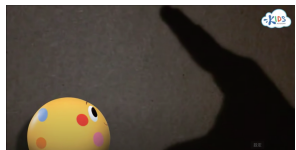
3-1 Sound Experiments
for Kids | Science for
Kids



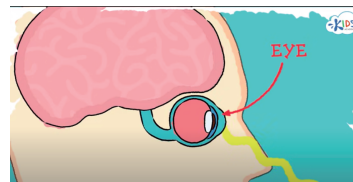
3-2 Light | The Dr.
Binocs Show



3-2 Light and Shadows
for Kids | Science Video
for Kids



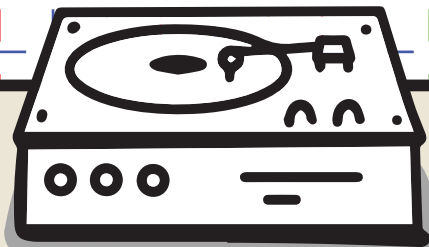
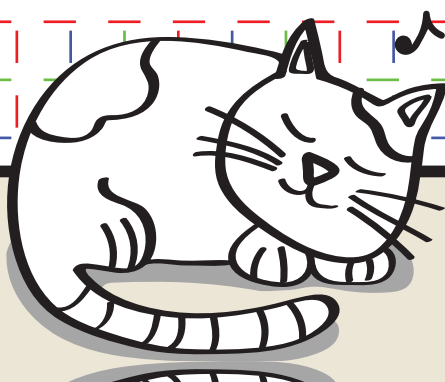
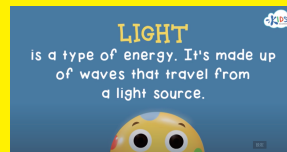
3-2 Sources of Light |
Science for Kids



3-3 Light and Sound
for Children | Science
for Kids



3-3 Communication
Using Light and Sound |
Science for Kids



Sound

Write **1** inside the ☐ if it happened first. Write **2** inside the ☐ if it happened next.

☐

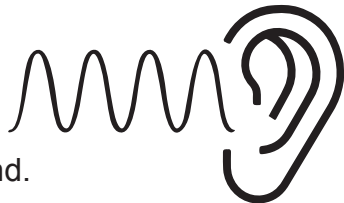
You play the guitar.


☐

The strings vibrate.


☐

You hear a sound.


☐

The strings vibrate.


☐

The strings stop vibrating.


☐

You stop playing the guitar.


☐

The strings stop vibrating.


☐

You don't hear a sound.



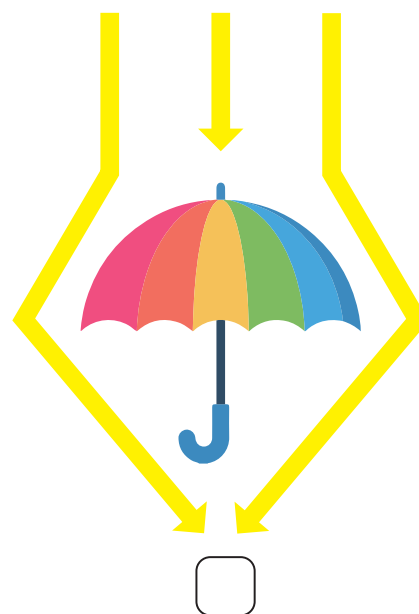
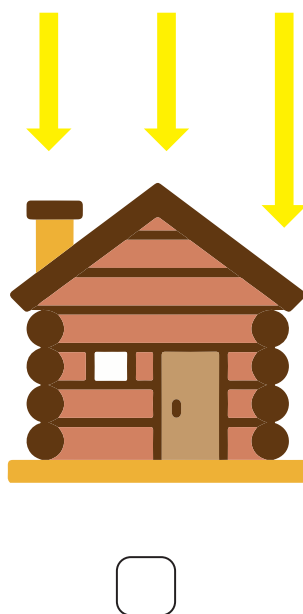
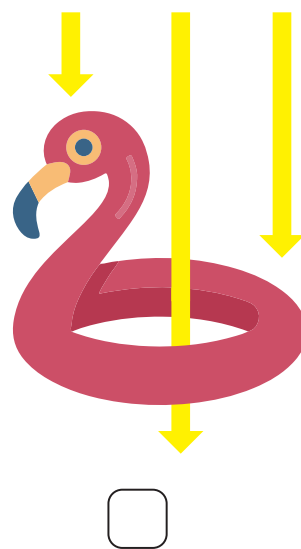
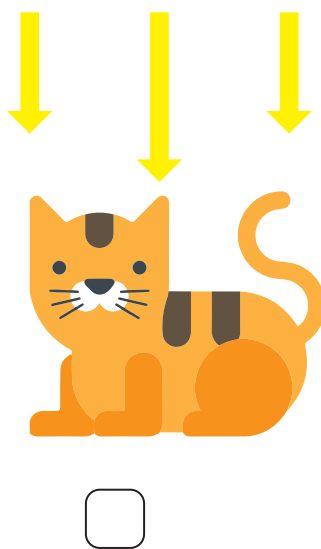
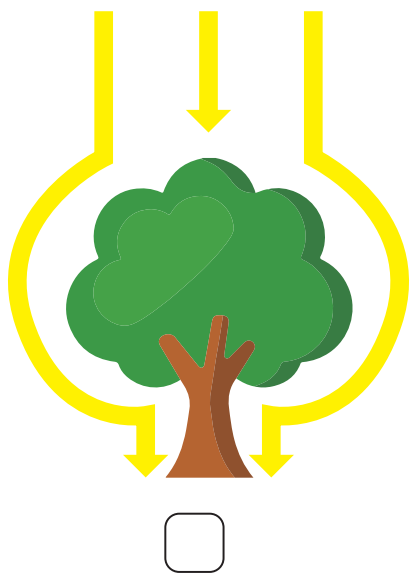
Draw something that makes a **soft** sound.

Draw something that makes a **loud** sound.

Light

Does light travel correctly?

If yes, put / inside the ☐. If no, put X inside the ☐.



Light travels in a straight line.

Shadow and reflection

Draw the tree's shadow.



The shadow's position depends on the Sun's position.

Does it reflect light?

If yes, put / inside the ☐. If no, put X inside the ☐.


☐

☐

☐

☐

☐

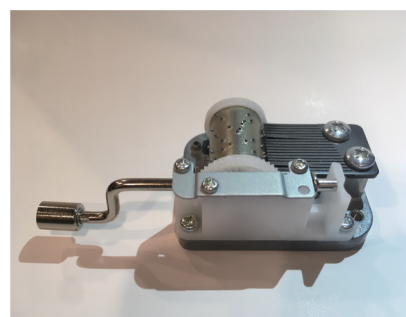

Smooth and shiny objects reflect light.

Uses of sound and light

How are sound and light used?

Check 😊 if they are used for **decoration** or **entertainment**.

Check ⚠ if they are used as a **signal** or **warning**.



Let's review

Fill in the blanks using the words below.

line
solid

reflected
vibrates

shadow
warning

Sound and light are always around us. But we wonder what they are.

Sound is produced when an object _____. It can travel through gas, liquid and _____.

Light comes from different sources like the Sun and lit candle. It travels in a straight _____. When an object blocks light, it forms a _____. When light hits a mirror, it is _____. Reflected light also travels in a straight line.

Sound and light can be used for decoration, entertainment, signal or _____.

Unit 4

Fun Circuit

好玩的電路



Fun Circuit 好玩的電路

Circuit connection 電路連接

Parts 構造

A battery has two electrodes: positive and negative.
電池有兩個電極：正極與負極。

A wire is made of copper. It is covered with plastic.
電線是銅線，外面是塑膠皮。

A light bulb emits light.
燈泡發出光。

Electricity flows through a closed circuit.
通路(電可以流通)。

Types 型式

Electricity does not flow through an open circuit.
斷路(電無法流通)。

Conductivity 傳導

Metals like paper clip and coin conduct electricity.
金屬物質，如迴紋針或硬幣有導電性。

Non-metals like paper and rubber do not conduct electricity.
非金屬物質，如橡皮筋、紙團沒有導電性。

Series and parallel circuit 串聯與並聯

Series circuit 串聯電路

In a series circuit, all light bulbs and batteries are connected along the same path.
串聯電路：數個燈泡或電池串接在同一個通路上。

If two light bulbs are connected in series, they will be less bright.
燈泡（串聯）時，燈泡亮度會減弱。

Parallel circuit 並聯電路

In a parallel circuit, light bulbs and batteries are connected along different paths.
並聯電路：數個燈泡或電池分別接在不同通路上。

If two light bulbs are connected in parallel, they will have the same brightness.
燈泡（並聯）時，燈泡亮度不變。

Circuits in daily life 生活中的電路

Motor is used in things like electric toy car and electric fan.
馬達用於電動玩具車，電動風扇。

Things are powered by batteries or electricity from power stations.
有些物品的供電來自電池或發電站傳送的電力。

Throw used battery in recycling stations.
電池電量用盡後要送到回收站。

Unit 4 Fun Circuit 好玩的電路

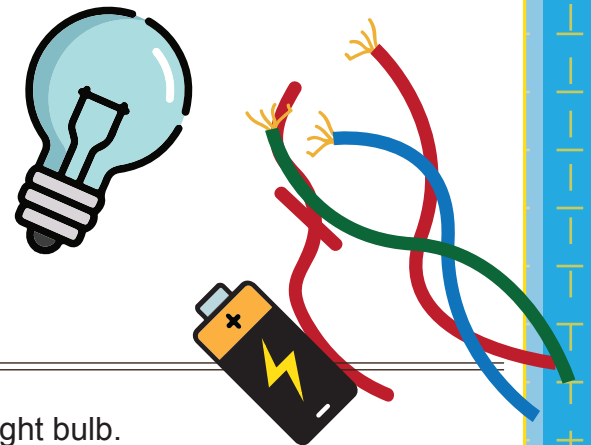
日期： /

應聽懂及認讀的生字

- | | |
|---------------------------------|--------------------|
| ☐ 1. 電路 | circuit |
| ☐ 2. 電池 | battery |
| ☐ 3. 電線 | wire |
| ☐ 4. 銅線 | copper wire |
| ☐ 5. 燈泡 | light bulb |
| ☐ 6. 電力 | electricity |
| ☐ 7. 傳導性 | conductivity |
| ☐ 8. 傳導 | conduct / conducts |
| ☐ 9. 導體 | conductor |

- | | |
|-----------------------------------|--------------------|
| ☐ 10. 正極 | positive electrode |
| ☐ 11. 負極 | negative electrode |
| ☐ 12. 通路 | closed circuit |
| ☐ 13. 斷路 | open circuit |
| ☐ 14. 串聯電路 | series circuit |
| ☐ 15. 並聯電路 | parallel circuit |

- | | |
|------------------------------------|------------------|
| ☐ 16. 提把 | handle |
| ☐ 17. 開關 | switch |
| ☐ 18. 燈罩 | lampshade |
| ☐ 19. 迴紋針 | paper clip |
| ☐ 20. 硬幣 | coin |
| ☐ 21. 手電筒 | flashlight |
| ☐ 22. 金屬片 | metal sheet |
| ☐ 23. 馬達 | motor |
| ☐ 24. 電動玩具車 | electric toy car |
| ☐ 25. 電風扇 | electric fan |



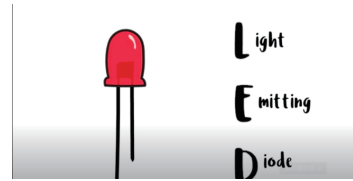
1. A simple circuit has three basic parts: battery, wire and light bulb.
一個簡單的電路包含三個基本部分：電池、電線和燈泡。
2. In a series circuit, all light bulbs and batteries are connected along the same path.
串聯電路：數個燈泡或電池串接在同一個通路上。
3. In a parallel circuit, light bulbs and batteries are connected along different paths.
並聯電路：數個燈泡或電池分別接在不同通路上。
4. When using electrical appliances, save electricity and pay attention to safety.
使用電器時，要節約用電，注意安全。

Science Videos Unit 4

4-1 Invention of Bulb



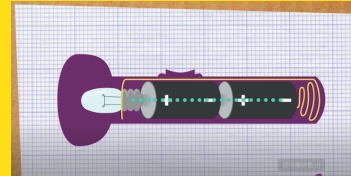
4-1 How Does an LED Work



4-1 LED Explained



4-1 The Power of Circuits



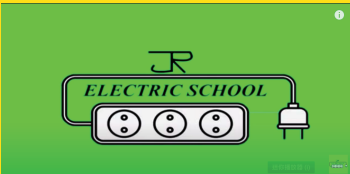
4-2 Electrical Circuits – Series and Parallel



4-2 What are Parallel Circuits



4-2 Series and Parallel Circuits Wiring



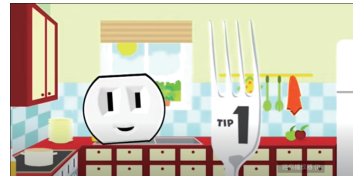
4-2 Why Parallel Circuit is Best for Hanging Lights



4-3 How Do Motors Work



4-3 Kids Safety

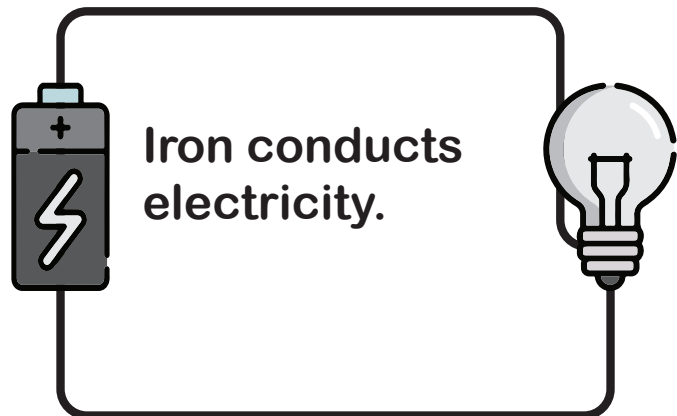
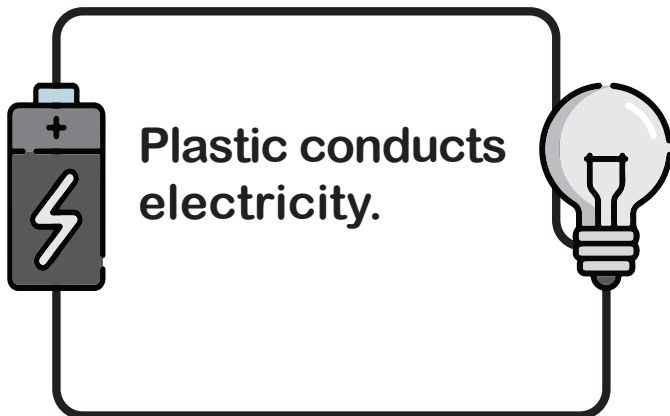
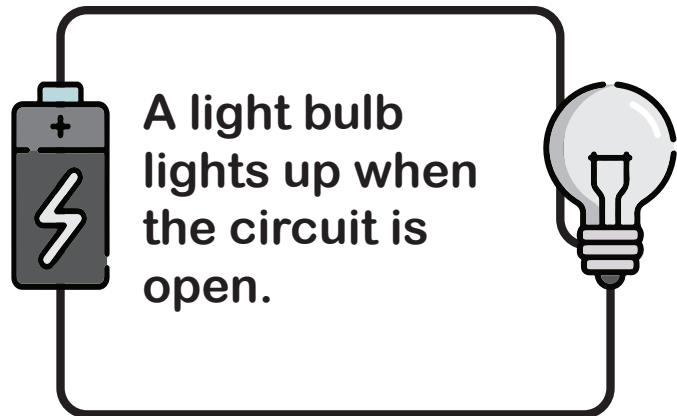
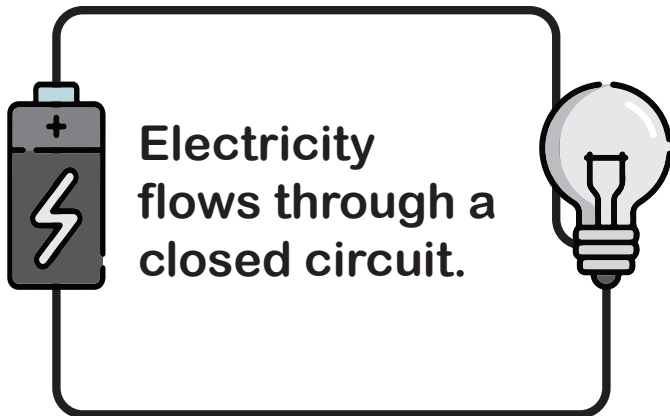
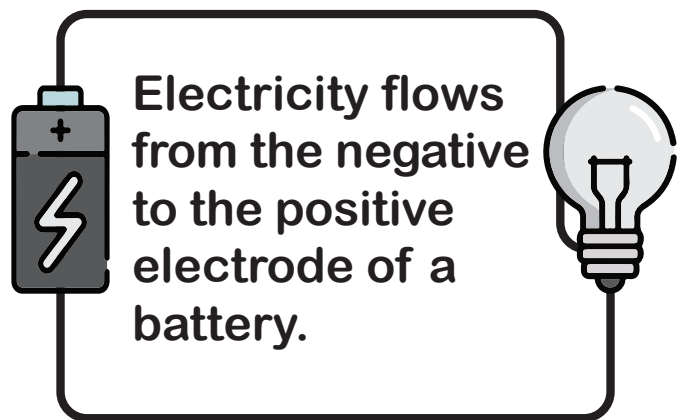
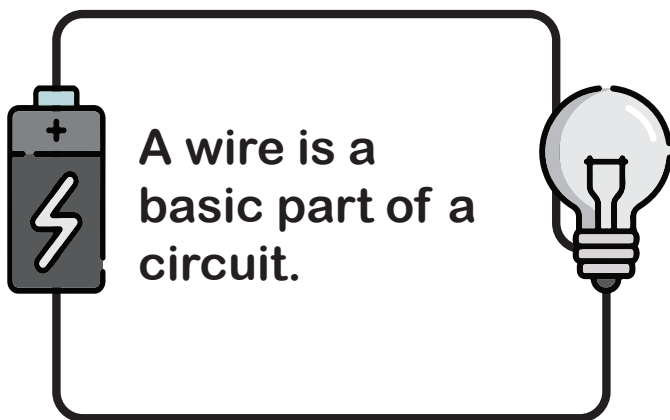


Circuit

True or False

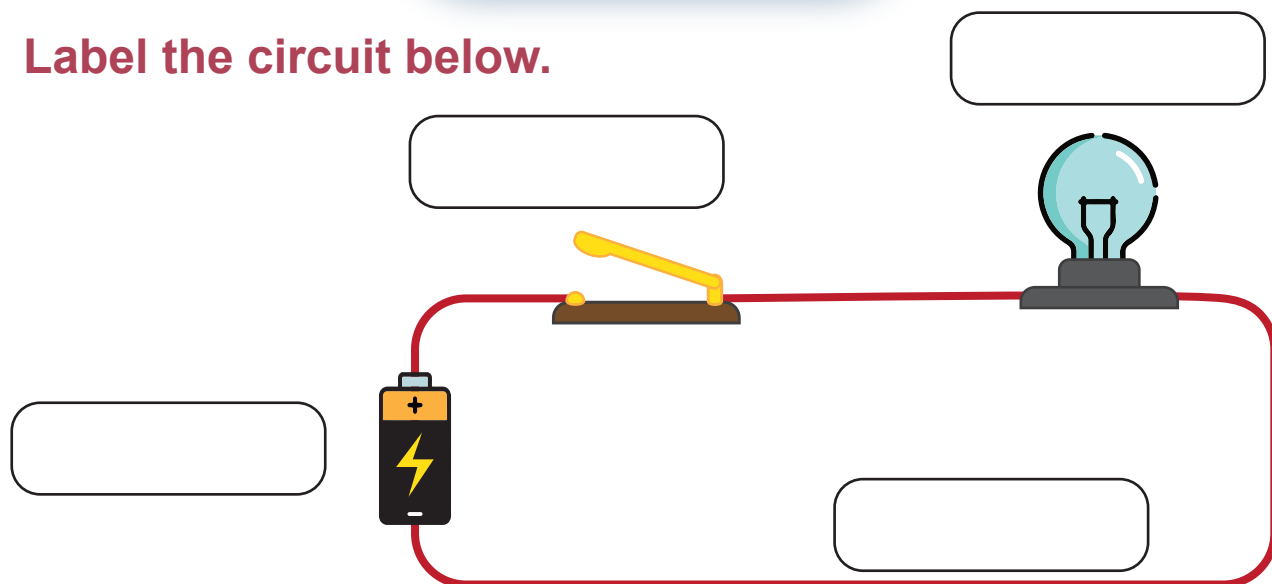
If the sentence is **true**, color the circuit **green**.

If the sentence is **false**, color the circuit **red**.



Circuit

Label the circuit below.



There is a symbol for each part of a circuit.



battery



wire



bulb



buzzer



motor

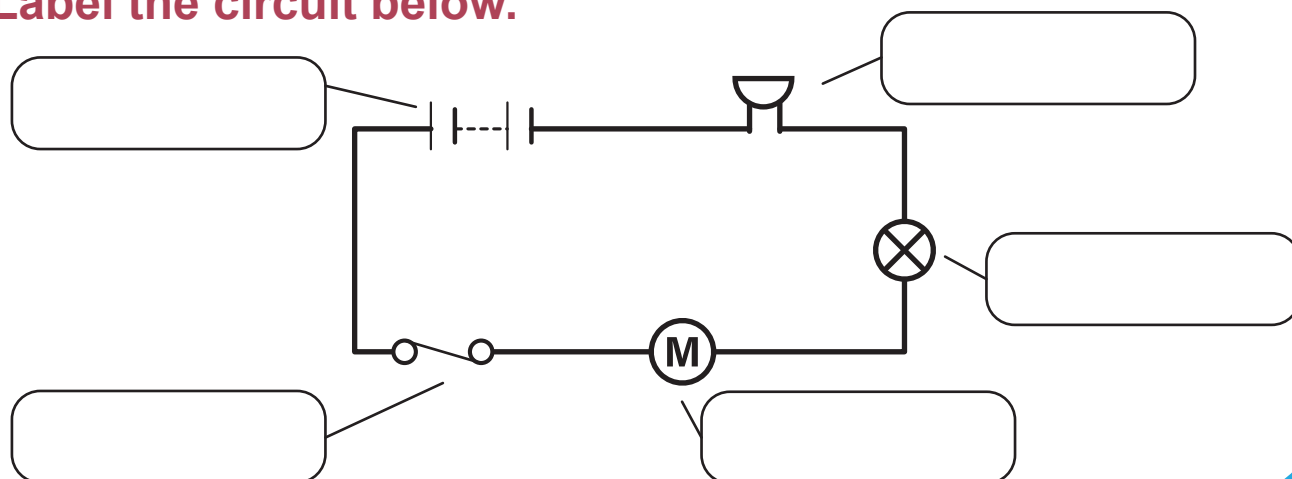


switch (off)



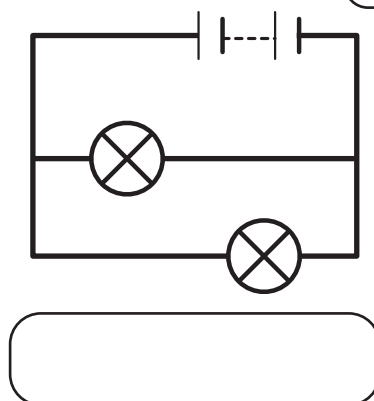
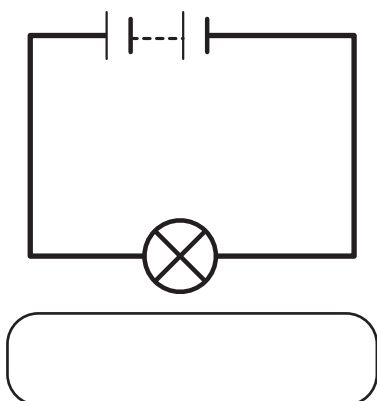
switch (on)

Label the circuit below.



Series and parallel circuits

Write **series circuit** or **parallel circuit** inside the .

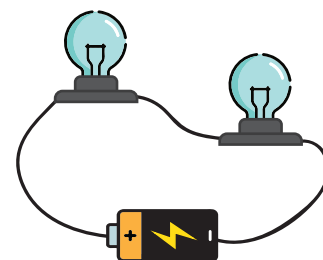


What is the difference between a series circuit and a parallel circuit?

Circle the letter of the correct answer.

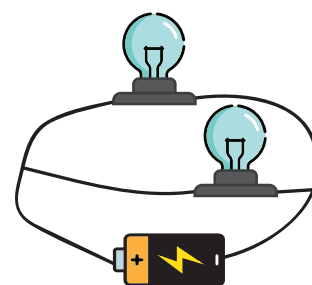
If two light bulbs are connected in series, the light bulbs _____.

- A. will be less bright
- B. will have the same brightness



If two light bulbs are connected in parallel, the light bulbs _____.

- A. will be less bright
- B. will have the same brightness



Motor and electrical safety

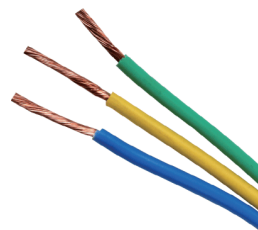
Can you make a motor work if you have these?



battery



motor



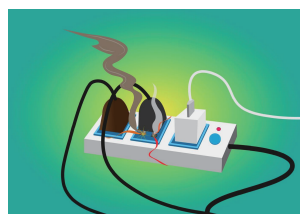
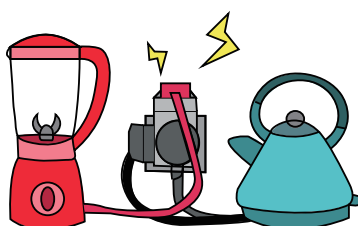
wire

Yes

No

Why?

Is this safe? Circle 😊 if yes and circle ☹️ if no.



Let's review

Fill in the blanks using the words below.

copper
rotate

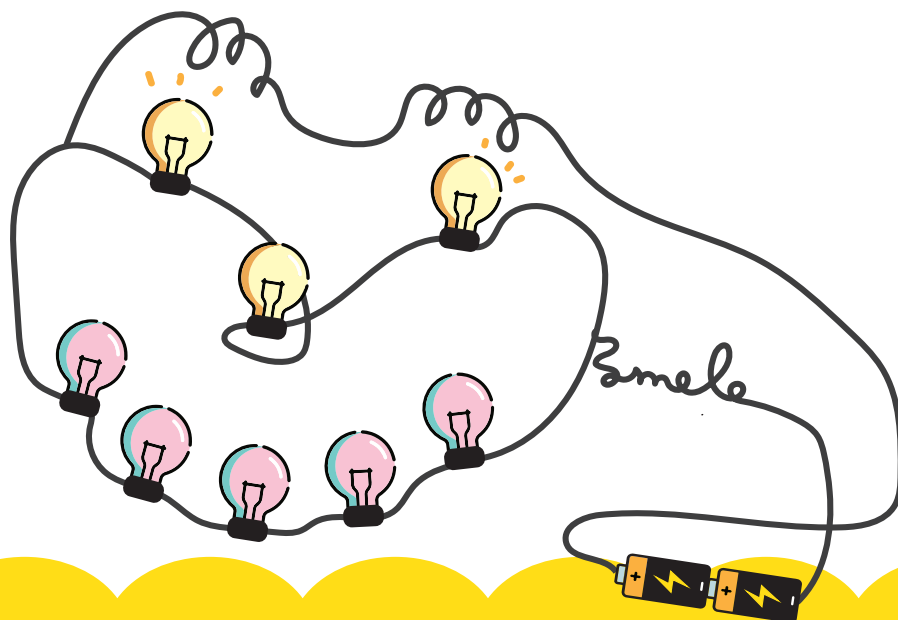
negative
series

parallel
wire

A simple circuit has three basic parts: battery, _____ and light bulb. A battery has two electrodes: positive and _____. A wire is made of _____. It is covered with plastic. A light bulb emits light.

There are two kinds of circuit: series and parallel. If two light bulbs are connected in _____, they will be less bright. If two light bulbs are connected in _____, they will have the same brightness.

In a circuit, the wire is connected to the metal sheet of the motor. This lets the motor _____. A motor makes electric toys and electrical appliances move.



[illegible]

[illegible]

Science Notes

English Immersion Program

4th Grade

1st Semester

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